

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of James F. KRAMER et al.

Serial No.: Unassigned

Examiner: TBD

Confirmation No.: Unassigned

Art Unit: TBD

Filed: Herewith

For: **SYSTEM AND METHOD FOR CONSTRAINING A GRAPHICAL HAND
FROM PENETRATING SIMULATED GRAPHICAL OBJECTS**

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**INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. §1.97(b)**

In accordance with the duty of disclosure set forth in 37 C.F.R. §1.56, Applicant(s) hereby submits the following information in conformance with 37 C.F.R. §§1.97 and 1.98.

- ☐ Pursuant to 37 C.F.R. §1.98, a copy of each document cited in the attached Form PTO/SB/08 is enclosed.
- ☒ No copies of the publications listed on the attached Form PTO/SB/08A are being provided pursuant to 37 C.F.R. §1.98(d) because the publications were previously cited by or submitted to the Office in prior Application Serial No. 09/432,362 filed on November 3, 1999, to which the above-identified application claims priority under 35 U.S.C. §120.
- ☐ No copies of any U.S. patents or U.S. patent application publications listed on the attached Form PTO/SB/08A are being provided pursuant to 37 C.F.R. §1.98 because this application was filed after June 30, 2003.
- ☐ Publication(s) ___ listed on the attached Form PTO/SB/08A were cited in a foreign search or examination report corresponding to ___ application serial no. and mailed on ___.
- ☐ Enclosed is a copy of a non-English publication(s) ___. Pursuant to §609 of the M.P.E.P., Applicant submits the attached foreign search or examination report, which cites such non-English language publication(s).

- ☐ Enclosed is a copy of a non-English publication(s) _____. English language publication ____ (copy enclosed) claims priority from this non-English publication.
- ☐ Enclosed is an explanation of non-English publication(s) ____ for which an English translation is not available.
- ☐ Enclosed is an English translation of non-English publication(s) ____ cited in the attached Form PTO/SB/08A.
- ☐ Enclosed is a copy of pending patent Application Serial No. _____.

This Information Disclosure Statement is filed within any one of the following time periods:

- ☒ within three months from the filing date of this national application other than a CPA under 37 C.F.R. § 1.53(d);
- ☐ within three months from the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in this international application;
- ☐ before the mailing date of a first office action on the merits; or
- ☐ before the mailing of a first office action after the filing of a request for continued examination under 37 C.F.R. § 1.114.

It is respectfully requested that the Examiner consider the above-noted information and return an initialed copy of the attached Form PTO/SB/08A to the undersigned.

Dated: March 17, 2004

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Respectfully submitted,
COOLEY GODWARD LLP

By:



Erik B. Milch
 Reg. No. 42,887

Please type a plus sign (+) inside this box → +

PTO/SB/08A (08-00)

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>		Complete if Known	
		Application Number	Unassigned
		Filing Date	Herewith
		First Named Inventor	James F. Kramer et al.
		Group Art Unit	Unassigned
		Examiner Name	Unassigned
Sheet	Page 1 of 4	Attorney Docket Number	IMMR055/01US

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code ² (if known)		
	A1	6,413,229	B1	Kramer et al.	07-02-2002
	A2	6,232,891		Rosenberg	05-2001
	A3	6,131,097		Peurach et al.	10-10-2000
	A4	6,111,577		Zilles et al.	08-29-2000
	A5	6,104,379		Petrich et al.	08-2000
	A6	6,061,004		Rosenberg	05-2000
	A7	6,042,555		Kramer et al.	03-28-2000
	A8	6,028,593		Rosenberg et al.	02-22-2000
	A9	5,986,643		Harvill et al.	11-16-1999
	A10	5,973,678		Stewart et al.	10-26-1999
	A11	5,912,658		Bergamasco et al.	06-15-1999
	A12	5,877,748		Redlich	03-02-1999
	A13	5,844,392		Peurach et al.	12-01-1998
	A14	5,835,693		James Lynch	11-1998
	A15	5,825,308		Rosenberg	10-20-1998
	A16	5,802,353		Avila et al.	09-01-1998
	A17	5,790,108		Salcudean et al.	08-04-1998
	A18	5,785,630		Bobick et al.	07-28-1998
	A19	5,766,016		Sinclair et al.	06-16-1998
	A20	5,694,013		Stewart et al.	12-02-1997
	A21	5,625,576		Massie et al.	04-29-1997
	A22	5,563,632		Jerry Roberts	10-1996
	A23	5,547,382		Yamasaki et al.	08-20-1996
	A24	5,466,213		Hogan et al.	11-14-1995
	A25	5,354,162		Burdea et al.	10-11-1994
	A26	5,334,027		Wherlock	08-02-1994
	A27	5,309,140		Everett, Jr. et al.	05-03-1994
	A28	5,299,810		Pierce et al.	04-05-1994
	A29	5,298,890		Kanamaru et al.	03-29-1994
	A30	5,275,174		Cook	01-04-1994
	A31	5,271,290		Fisher	12-21-1993
	A32	5,240,417		Smithson et al.	08-31-1993
	A33	5,212,473		Louis	05-18-1993
	A34	5,184,319		Kramer	02-02-1993
	A35	5,184,009		Wright et al.	02-02-1993
	A36	5,078,152		Bond et al.	01-07-1992
	A37	5,038,089		Szakaly	08-06-1991
	A38	5,035,242		Franklin et al.	07-30-1991
	A39	5,022,407		Horch et al.	06-11-1991
	A40	5,019,761		Kraft	05-28-1991

¹ Unique citation designation number.

² See attached Kinds of U.S. Patent Documents.

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U.S. PATENT DOCUMENTS					
	A41	4,988,981		Zimmerman et al.	01-29-1991
	A42	4,934,694		McIntosh	06-19-1990
	A43	4,930,770		Baker	06-05-1990
	A44	4,891,764		McIntosh	01-02-1990
	A45	4,794,392		Selinko	12-27-1988
	A46	4,713,007		Alban	12-15-1987
	A47	4,708,656		De Vries et al.	12-24-1987
	A48	4,599,070		Hladky et al.	07-08-1986
	A49	4,581,491		Boothroyd	04-08-1986
	A50	4,542,291		Zimmerman	09-17-1985
	A51	4,513,235		Acklam et al.	04-23-1985
	A52	4,236,325		Hall et al.	12-02-1980
	A53	4,160,508		Salisbury, Jr.	07-10-1979
	A54	3,911,416		Feder	10-07-1975
	A55	3,903,614		Diamond et al.	09-09-1975
	A56	3,902,687		Hightower	09-02-1975
	A57	3,623,064		Kagan	11-23-1971
	A58	3,517,446		Corlyon et al.	06-30-1970
	A59	3,497,668		Hirsch	02-24-1970
	A60	3,220,121		Cutler	11-30-1965
	A61	3,157,853		Hirsch	11-17-1964

FOREIGN PATENT DOCUMENTS						
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		Office ¹	Number ²	Kind Code ³ (if known)		
	B1		0 349 086	A1	Stork Kwant B.V.	01-03-1990

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		
	C1	Baigrie, "Electric Control Loading - A Low Cost, High Performance Alternative," <i>Proceedings of Interservice/Industry Training Systems Conference</i> , pp. 247-254, November 6-8, 1990		
	C2	Iwata, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp. 287-292, 1993		
	C3	Russo, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," <i>MIT Libraries Archives</i> pp. 1-131, May 1990, archived 8/14/90		
	C4	Brooks et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," <i>JPL Publication 85-11</i> , NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985		
	C5	Jones et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); <i>Experimental Brain Research</i> , Vol. 79, No. 1, pp. 150-156, 1990		
	C6	Burdea et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," 1993 <i>IEEE International Conference on Robotics and Automation</i> , pp. 25-44, 05/02/1993		
	C7	Snow et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. NPO-17851; JPL Case No. 7348, pp. 1-4 with 45 pages of attachments, 06/15/1989		

¹ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).

² For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

³ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.

⁴ Applicant is to place a check mark here if English language Translation is attached.

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		Group Art Unit	Unassigned
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Sheet	Page 3 of 4	Attorney Docket Number	IMMR055/01US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
C8	Ouh-Young, "Force Display in Molecular Docking," Doctoral Dissertation, University of North Carolina at Chapel Hill, UMI Order No. 9034744, p. 1-369, 1990		
C9	Tadros, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators," <i>MIT Archive</i> , pp. 1-88, February 1990, archived 8/13/90		
C10	Caldwell et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993		
C11	Adelstein et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 1-12, 1992		
C12	Gotow et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WAI1-11:00, pp. 332-337		
C13	Stanley et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 55-61, ASME 1992		
C14	Russo, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 63-70, ASME 1992		
C15	Kontarinis et al., "Display of High-Frequency Tactile Information to Teleoperators," <i>Telemanipulator Technology and Space Telerobotics</i> , Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993		
C16	Patrick et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," <i>Cooperative Intelligent Robotics in Space</i> , Rui J. deFigueiredo et al, Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990		
C17	Adelstein, "A Virtual Environment System For The Study of Human Arm Tremor," <i>Ph.D. Dissertation</i> , Dept. of Mechanical Engineering, MIT, June 1989, archived 3/13/90		
C18	Bejczy, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," <i>Science</i> , Vol. 208, No. 4450, pp. 1327-1335, 1980		
C19	Bejczy et al., "Generalization of Bilateral Force-Reflecting Control of Manipulators," <i>Proceedings Of Fourth CISM-IFTOMM</i> , Sep. 8-12, 1981		
C20	McAfee et al., "Teleoperator Subsystem/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," JPL 1988, JPL D-5172		
C21	Minsky, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," <i>Ph.D. Dissertation</i> , MIT, June 1995, archived 7/6/95		
C22	Jacobsen et al., "High Performance, Dextrous Telerobotic Manipulator With Force Reflection," <i>Intervention/ROV '91 Conference & Exposition</i> , Hollywood, Florida, May 21-23, 1991		
C23	Shimoga, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," <i>Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration</i> , Rensselaer Polytechnic Institute, Sep. 30- Oct. 1, 1992		
C24	IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990		
C25	Terry et al., "Tactile Feedback In A Computer Mouse," <i>Proceedings of Fourteenth Annual Northeast Bioengineering Conference</i> , University of New Hampshire, March 10-11, 1988		
C26	Howe, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," <i>Proceedings of the 1992 IEEE International Conference on Robotics and Automation</i> , Nice, France, May 1992		
C27	Eberhardt et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," <i>IEEE Virtual Reality Annual International Symposium</i> , Seattle, WA, Sep. 18-22, 1993		
C28	Rabinowitz et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contractor area," <i>Journal of The Acoustical Society of America</i> , Vol. 82, No. 4, October 1987		
C29	Bejczy et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," <i>International Computer Technology Conference, The American Society of Mechanical Engineers</i> , San Francisco, CA, August 12-15, 1980		
C30	Bejczy et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," <i>SOAR '89 Workshop, JSC</i> , Houston, TX, July 25-27, 1989		
C31	Ouhyoung et al., "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," <i>IEEE Transactions on Consumer Electronics</i> , Vol. 41, No. 3, August 1995		
C32	Marcus, "Touch Feedback in Surgery," <i>Proceedings of Virtual Reality and Medicine The Cutting Edge</i> , Sep. 8-11, 1994		
C33	Bejczy, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987		
C34	SCANNELL, "Taking a Joystick Ride," <i>Computer Currents</i> , Boston Edition, Vol. 9, No. 11, November 1994.		
C35	"Component Maintenance Manual With Illustrated Parts List, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 28 January 2002 (3 pages).		

Examiner Signature		Date Considered	
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OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
	C36	“Technical Manual Overhaul Instructions With Parts Breakdown, Coaxial Control Shaker Part No. C-25502,” Safe Flight Instrument Corporation, Revised 15 July 1980 (23 pages).	
	C37	Gardner, Dana L., “The Power Glove”, Design News, December 4, 1989, pp. 63-68	
	C38	Eddy, Andy “Power Glove: Get a Grip On Your Games”, Video Games & Computer Entertainment, September 1989, pp. 18-20	
	C39	Brooks, F. et al., “Project GROPE – Haptic Displays for Scientific Visualization,” Computer Graphics, Vol. 24, No. 4, 1990, pp. 177-185	
	C40	Hirota, Koichi et al., “Development of Surface Display,” IEEE 0-7803-1363-1, 1993, pp. 256-262	
	C41	Rosenberg, Louis B., “Perceptual Design of a Virtual Rigid Surface Contact,” Center for Design Research Stanford University, Air Force Material Command, April 1993, pp. 1-41	
	C42	Colgate, J. et al., “Implementation of Stiff Virtual Walls in Force-Reflecting Interfaces,” Sept. 22, 1993	
	C43	Kelley, A.J. et al. “MagicMouse: Tactile and Kinesthetic Feedback in the Human-Computer Interface using an Electromagnetically Actuated Input/Output Device,” Dept. of Elec. Engineering, Univ. of British Columbia, 1993, pp. 1-27	
	C44	Rosenberg, L. et al., “Perceptual Decomposition of Virtual Haptic Surfaces,” Proceedings IEEE Symposium on Research Frontiers in Virtual Reality, Oct. 1993	
	C45	P. Coiffet et al., “The LRP Dextrous Hand Master,” VR Systems Fall 1993 Conference, Sig Advanced Applications, New York City, October 1993	
	C46	D.H. Gomez et al., “Integration of the Rutgers Master II in a Virtual Reality Simulation” 1995 IEEE Virtual Reality Annual International Symposium, pp. 198-202, San Francisco, CA 1995	
	C47	G.R. Luecke et al. “An Exoskeleton Manipulator for Application of Electro-Magnetic Virtual Forces,” Proceedings of the 1996 ASME Dynamics Systems and Control Division, pp. 489-494, Atlanta GA, November 17-22, 1996	
	C48	L. Rosenberg, “A Force Feedback Programming Primer – For PC Gaming Peripherals Supporting I-Force 2.0 and Direct X 5.0,” San Jose, CA 1997	
	C49	SensAble Technologies, “GHOST Software Developer’s Toolkit – Programmer’s Guide Version 1.1,” Cambridge, MA 1996	
	C50	T.V. Thompson II et al., “Maneuverable Nurbs Models within a Haptic Virtual Environment,” Proceedings of the 1997 ASME Dynamics Systems and Control Division, pp. 37-44, Dallas, TX, November 16-21, 1997	
	C51	H. Noma et al., “Cooperative Object Manipulation in Virtual Space Using Virtual Physics,” Proceedings of the 1997 ASME Dynamic Systems and Control Division, pp. 101-106, Dallas, TX November 16-21, 1997	

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